REMARKS

This Response responds to the Office Action dated August 15, 2006 in which the Examiner rejected claims 1-6 and 9-13 under 35 U.S.C. §103 and stated that claims 14-16 are allowed.

Claims 1 and 3 claim an optical fiber holding device and claim 13 claims an optical dispersion-equalizer. The devices comprise an optical fiber having a grating, a strip-shaped member and a substrate. Claim 3 additionally claims a heater. Claim 13 claims additionally a heater, a heater control circuit, a peltier element, a temperature sensor, a peltier element control circuit and optical circuitry. The strip-shaped member has a rectilinear groove in which the optical fiber is accommodated. A gap is formed between a wall surface of the rectilinear groove and the optical fiber. A gel substance, which remains soft, contacts with the optical fiber and is filled in the gap. The substrate is provided for mounting the strip-shaped member and optical fiber or heater. A positioning mark is provided on the substrate, which is used for positioning the strip-shaped member on the substrate.

Through the structure of the claimed invention having a positioning mark provided on the substrate which is used for positioning the strip-shaped member on the substrate, as claimed in claim 1, the claimed invention provides an optical fiber holding device and an optical dispersion-equalizer which facilitates positioning of the grating with respect to the heater and prevents polarization mode dispersion characteristics from being degraded without occurring dislocation of the grating from the heater. The prior art does not show, teach or suggest the invention as claimed in claims 1, 3 and 13.

Claims 1-6 and 9-13 were rejected under 35 U.S.C. §103 as being unpatentable over admitted prior art in view of *Chamberlain et al.* (U.S. Patent 6,411,746), *Lauzon et al.* (U.S. Patent 5,671,307) and *Koyabu et al.* (JP 3-134603).

Applicants respectfully traverse the Examiner's rejection of the claims under 35 U.S.C. §103. The claims have been reviewed in light of the Office Action, and for reasons which will be set forth below, Applicants respectfully request the Examiner withdraws the rejection to claims and allows the claims to issue.

Referring to FIG. 14, an optical fiber 1 is made of a core and a clad; a grating 2 is formed at a part of the core of the optical fiber and reflects an optical signal of a number of wavelengths; a heater 3 which is made of a thin film for heating the grating to a predetermined temperature distribution; and a substrate 4 which is, for instance, made of quartz and on which the heater 3 is mounted. The grating 2 is used for compensating the wavelength dispersion of a number of optical signals propagated through the optical fiber 1. As shown in FIG. 14, the optical fiber 1 is directly mounted on the heater 3 which is made of the thin film. (Page 1, lines 17-28).

Thus, prior art FIG. 14 of the specification discloses an optical fiber, a heater and a substrate. Nothing in Applicants' admitted prior art shows, teaches or suggests a positioning mark provided on the substrate which is used for positioning the stripe-shaped member on the substrate, as claimed in claims 1, 3 and 13.

Chamberlain et al. is directed to the control of optical properties of an optical fiber device by thermal manipulation. (Column 1, lines 7-9). A thermally tunable optical device includes an optical fiber device 12. (Column 3, lines 55-65). As depicted in FIG. 1, the tunable optical device 10 includes a heater 14. The heater 14

includes a metal layer 18 and a first electrical contact 20 and a second electrical contact 22 that are spaced apart from one another. The metal layer 18 is a thin metallic film coated onto the surface of an optical fiber device 12. (Column 3, lines 55-65). As shown in FIG. 2, the tunable optical device may be mounted to a substrate 42. The optical fiber device 12 is tensioned and attached to a substrate 42 that has two metallized strips 44 forming an assembly 46. The substrate 42 is a zero-expansion material, typically a ceramic, glass or glass-ceramic. (Column 4, lines 27-32). Tensioning the optical fiber device 12 ensures that when the optical fiber device 12 is a fiber Bragg grating that the grating portion 50 of the optical fiber device 12 remains straight throughout the range of operating temperatures. When the optical fiber device 12 is a fiber Bragg grating and the substrate 42 is an ultra-low expansion material, neither the grating temperature nor the ambient temperature influences the total length of the grating 50. (Column 4, lines 36-43). In an alternate embodiment of the invention, as shown in FIG. 3, the heater 14 includes a metal layer 18 deposited on the sides of a groove 34 in a substrate 32. The substrate may be silica, glass or another material chosen to obtain specified thermal response characteristics. Exemplary of this embodiment is the tunable optical device 10 shown in FIG. 4, this embodiment includes a slotted heater 36 in which the substrate 42 is a capillary tube with an axial bore 62 larger than the diameter of the optical fiber device 12. (Column 4, lines 54-63). In a typical embodiment, the region between the metal layer 18 and the optical fiber device 12 is filled with a hybrid organic/inorganic, glass or glass-ceramic material produced by a sol-gel process. (Column 5, lines 13-20).

Thus, *Chamberlain et al.* merely discloses a sol-gel process used to make a glass or ceramic material that fills a region between a metal layer 18 and an optical

device 12. Nothing in *Chamberlain et al.* shows, teaches or suggests a positioning mark provided on a substrate which is used for positioning a strip-shaped member on the substrate, as claimed in claims 1, 3 and 13.

Lauzon et al. discloses apparatus and a method for chirping a grating using a temperature gradient. (col. 1, lines 8-9) More particularly, it discloses positioning an optical fiber 1 in a groove 4 of a brass plate 3 which is heated by peltier effect plates 6, 7, 11 and 12.

Thus, *Lauzon et al.* merely discloses positioning an optical fiber in a groove of a brass plate which is heated by peltier effect plates 6, 7, 11 and 12. Nothing in *Lauzon et al.* shows, teaches or suggests a positioning mark provided on a substrate and used for positioning a strip-shaped member on the substrate, as claimed in claims 1, 3 and 13. Rather, the optical fiber in *Lauzon et al.* is positioned in a groove and thus no positioning mark is needed.

Koyabu et al. appears to disclose V grooves 2 are formed in a V grooved substrate 1 made of Si single crystal by antisotropic etching, and optical fibers 3 are held in V grooves 2. Positions in the Z direction of cores 4 of optical fibers to the surface of the substrate are determined with a high precision. An LiNbO<SB>3</SB> substrate 5 is so constituted that its surface where optical waveguides 6 are formed and the surface of the substrate 1 where V grooves 2 are formed are brought into contact with each other. Both surfaces are polished surfaces, and positions of optical waveguides 6 in the Z direction to the surface of the substrate 1 are accurately determined. Alignment marks of substrates 1 and 5 are used to position them in X and Y directions with a high precision. Two

substrates are adhered and fixed to each other with an adhesive obtained from grooves 7.

Thus, *Koyabu et al.* merely discloses alignment marks in order to align substrates 1 and 5. Nothing in *Koyabu et al.* shows, teaches or suggests a positioning mark used for positioning a strip-shaped member on a substrate, as claimed in claims 1, 3 and 13. Rather, *Koyabu et al.* only discloses alignment marks used to position substrates 1 and 5.

Additionally, *Koyabu et al.* merely discloses grooves formed in a substrate. Nothing in *Koyabu et al.* shows, teaches or suggests a positioning mark provided on a substrate, as claimed in claims 1, 3 and 13.

Furthermore, *Koyabu et al.* discloses grooves 2 for holding fibers 3. Thus, *Koyabu et al.* teaches away from the claimed invention and positions the fibers in grooves. Thus, no positioning mark is needed for *Koyabu et al.*

Since nothing in the prior art, *Chamberlain et al.*, *Lauzon et al.* or *Koyabu et al.* show, teach or suggest a positioning mark provided on a substrate which is used for positioning the strip-shaped member on the substrate as claimed in claim 1, Applicants respectfully request the Examiner withdraws the rejection to claims 1, 3 and 13 under 35 U.S.C. §103.

Claims 2, 4-6 and 9-12 depend from claims 1 and 3 and recite additional features. Applicants respectfully submit that claims 2, 4-6 and 9-12 would not have been obvious over the admitted prior art, *Chamberlain et al.*, *Lauzon et al.* or *Koyabu et al.* at least for the reasons as set forth above. Therefore, Applicants respectfully request the Examiner withdraws the rejection to claims 2, 4-6 and 9-12 under 35 U.S.C. §103.

The prior art of record, which is not relied upon, is acknowledged. The references taken singularly or in combination do not anticipate or make obvious the claimed invention.

Thus it now appears that the application is in condition for reconsideration and allowance. Reconsideration and allowance at an early date are respectfully requested.

If for any reason the Examiner feels that the application is not now in condition for allowance, the Examiner is requested to contact, by telephone, the Applicants' undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed within the currently set shortened statutory period, Applicants respectfully petition for an appropriate extension of time. The fees for such extension of time may be charged to our Deposit Account No. 02-4800.

In the event that any additional fees are due with this paper, please charge our Deposit Account No. 02-4800.

Respectfully submitted,

BUCHANAN INGERSOLL & ROONEY PC

Date: November 15, 2006 By:

Ellen Marcie Emas
Registration No. 32131

P.O. Box 1404
Alexandria, VA 22313-1404
703 836 6620